

Amendments to the Claims:

The following lists all claims and their status:

1-4183. (cancelled)

4184. (currently amended): A mixture produced from a portion of a coal formation, ~~the mixture~~, comprising:

a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5; and

wherein a weight ratio of the hydrocarbons having carbon numbers from 2 through 4, ~~to methane, to methane~~ in the mixture is greater than approximately 1.

4185. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4186. (currently amended): The mixture of claim 4184, wherein a molar ratio of ethene to ethane in the non-condensable hydrocarbons component ranges from about 0.001 to about 0.15.

4187. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4188. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4189. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise

oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4190. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4191. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4192. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4193. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4194. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise cycloalkanes.

4195. (currently amended): The mixture of claim 4184, wherein the non-condensable ~~hydrocarbons further component~~ comprises hydrogen, wherein the hydrogen is greater than about 10 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable ~~hydrocarbons component~~, and wherein the hydrogen is less than about 80 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable ~~hydrocarbons component~~.

4196. (original): The mixture of claim 4184, further comprising ammonia, wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

4197. (original): The mixture of claim 4184, further comprising ammonia, wherein the ammonia is used to produce fertilizer.

4198. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein less than about 15 weight % of the condensable hydrocarbons have a carbon number greater than approximately 25.

4199. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons comprise olefins, and wherein about 0.1 % to about 5 % by weight of the condensable hydrocarbons comprises olefins.

4200. (currently amended): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons ~~comprises~~ comprise olefins, and wherein about 0.1 % to about 2.5 % by weight of the condensable hydrocarbons comprises olefins.

4201. (original): The mixture of claim 4184, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons comprise oxygenated hydrocarbons, and wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4202. (currently amended): The mixture of claim 4184, ~~further comprising non-condensable hydrocarbons,~~ wherein the non-condensable hydrocarbons component ~~comprise~~ comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable hydrocarbons component comprises H<sub>2</sub>.

4203. (currently amended): The mixture of claim 4184, ~~further comprising non-condensable hydrocarbons,~~ wherein the non-condensable component hydrocarbons ~~comprise~~ comprises H<sub>2</sub>, and wherein greater than about 15 % by weight of the non-condensable component hydrocarbons comprises H<sub>2</sub>.

4204. (currently amended): The mixture of claim 4184, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane, to methane~~ is greater than about 0.3.

4205. (currently amended): A mixture produced from ~~a portion of a~~ coal formation, ~~the mixture~~ comprising:

~~a non-condensable component hydrocarbons~~ comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, ~~to methane, to methane~~ is greater than approximately 1; and

condensable hydrocarbons comprising oxygenated hydrocarbons, wherein greater than about 5 % by weight of the condensable ~~component hydrocarbons~~ comprises oxygenated hydrocarbons.

4206. (original): The mixture of claim 4205, wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4207. (currently amended): The mixture of claim 4205, wherein a molar ratio of ethene to ethane in the non-condensable ~~hydrocarbons component~~ ranges from about 0.001 to about 0.15.

4208. (original): The mixture of claim 4205, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4209. (original): The mixture of claim 4205, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4210. (original): The mixture of claim 4205, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4211. (original): The mixture of claim 4205, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4212. (original): The mixture of claim 4205, wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4213. (original): The mixture of claim 4205, wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4214. (original): The mixture of claim 4205, wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4215. (original): The mixture of claim 4205, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4216. (currently amended): The mixture of claim 4205, wherein the non-condensable hydrocarbons component comprises hydrogen, wherein the hydrogen is greater than about 10 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable component hydrocarbons, and wherein the hydrogen is less than about 80 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable component hydrocarbons.

4217. (currently amended): The mixture of claim 4205, wherein the produced mixture comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

4218. (currently amended): The mixture of claim 4205, wherein the produced mixture comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4219. (original): The mixture of claim 4205, wherein less than about 5 weight % of the condensable hydrocarbons in the mixture have a carbon number greater than approximately 25.

4220. (original): The mixture of claim 4205, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % to about 5 % by weight of the condensable hydrocarbons comprises olefins.

4221. (original): The mixture of claim 4205, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % to about 2.5 % by weight of the condensable hydrocarbons comprises olefins.

4222. (currently amended): The mixture of claim 4205, wherein the non-condensable ~~hydrocarbons further comprise component comprises H<sub>2</sub>, and~~ wherein greater than about 5 % by weight of the ~~mixture non-condensable component~~ comprises H<sub>2</sub>.

4223. (currently amended): The mixture of claim 4205, wherein the non-condensable ~~hydrocarbons further comprise component comprises H<sub>2</sub>, and~~ wherein greater than about 15 % by weight of the ~~mixture non-condensable component~~ comprises H<sub>2</sub>.

4224. (currently amended): The mixture of claim 4205, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane, to methane~~ is greater than about 0.3.

4225-4241. (cancelled)

4242. (original): A mixture produced from ~~a portion of~~ a coal formation, ~~the mixture~~ comprising:

~~a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, to methane, to methane~~ is greater than approximately 1;

ammonia, wherein greater than about 0.5 % by weight of the mixture comprises ammonia; and

condensable hydrocarbons comprising oxygenated hydrocarbons, wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4243. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4244. (original): The mixture of claim 4242, wherein the non-condensable hydrocarbons further comprise ethene and ethane, and wherein a molar ratio of ethene to ethane in the non-condensable hydrocarbons ranges from about 0.001 to about 0.15.

4245. (previously presented): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise nitrogen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4246. (previously presented): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise oxygen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4247. (previously presented): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise sulfur containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4248. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise oxygen containing compounds, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4249. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise aromatic compounds, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4250. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise multi-aromatic rings, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4251. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise asphaltenes, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4252. (original): The mixture of claim 4242, wherein the condensable hydrocarbons further comprise cycloalkanes, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4253. (currently amended): The mixture of claim 4242, wherein the non-condensable ~~hydrocarbons further comprise component comprises~~ hydrogen ( $H_2$ ), wherein the hydrogen is greater than about 10 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable ~~hydrocarbons component~~, and wherein the hydrogen is less than about 80 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable ~~component hydrocarbons~~.

4254. (original): The mixture of claim 4242, wherein the ~~produced~~ mixture further comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

4255. (original): The mixture of claim 4242, wherein the ~~produced~~ mixture further comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4256. (original): The mixture of claim 4242, wherein the condensable hydrocarbons comprise hydrocarbons having a carbon number of greater than approximately 25, and wherein less than about 15 weight % of the hydrocarbons in the mixture have a carbon number greater than approximately 25.

4257. (currently amended): The mixture of claim 4242, wherein the non-condensable hydrocarbons further comprise component comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the mixture non-condensable component comprises H<sub>2</sub>.

4258. (currently amended): The mixture of claim 4242, wherein the non-condensable component comprises hydrocarbons further comprise H<sub>2</sub>, and wherein greater than about 15 % by weight of the mixture non-condensable component comprises H<sub>2</sub>.

4259. (currently amended): The mixture of claim 4242, wherein the non-condensable hydrocarbons further comprise hydrocarbons having carbon numbers of greater than 2, wherein a weight ratio of hydrocarbons having carbon numbers greater than 2 to methane, to methane, is greater than about 0.3.

4260. (currently amended): A mixture produced from a portion of a coal formation, the mixture comprising:

a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, to methane, to methane is greater than approximately 1; and

condensable hydrocarbons comprising olefins, wherein less than about 10 % by weight of the condensable hydrocarbons comprises olefins.

4261. (currently amended): The mixture of claim 4260, wherein the non-condensable hydrocarbons further comprise component comprises ethene and ethane, and wherein a molar ratio of ethene to ethane in the non-condensable component hydrocarbons ranges from about 0.001 to about 0.15.

4262. (previously presented): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise nitrogen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4263. (previously presented): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise oxygen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4264. (previously presented): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise sulfur containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4265. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise oxygen containing compounds, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4266. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise aromatic compounds, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4267. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise multi-ring aromatics, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4268. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise asphaltenes, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4269. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise cycloalkanes, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4270. (currently amended): The mixture of claim 4260, wherein the non-condensable hydrocarbons further comprises component comprises hydrogen, and wherein the hydrogen is greater than about 10 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable hydrocarbons component and wherein the hydrogen is less than about 80 % by volume at 25 °C and one atmosphere absolute pressure of the non-condensable component hydrocarbons.

4271. (original): The mixture of claim 4260, wherein the produced mixture further comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

4272. (original): The mixture of claim 4260, wherein the produced mixture further comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4273. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise hydrocarbons having a carbon number of greater than approximately 25, and wherein less than about 15 % by weight of the hydrocarbons have a carbon number greater than approximately 25.

4274. (currently amended): The mixture of claim 4260, wherein about 0.1 % to about 5 % by weight of the condensable component hydrocarbons comprises olefins.

4275. (currently amended): The mixture of claim 4260, wherein about 0.1% to about 2 % by weight of the condensable component hydrocarbons comprises olefins.

4276. (original): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise oxygenated hydrocarbons, and wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4277. (currently amended): The mixture of claim 4260, wherein the condensable hydrocarbons further comprise oxygenated hydrocarbons, and wherein greater than about 25 % by weight of the condensable ~~component~~hydrocarbons comprises oxygenated hydrocarbons.

4278. (currently amended): The mixture of claim 4260, wherein the non-condensable ~~hydrocarbons further comprise component comprises~~ H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable ~~component~~hydrocarbons comprises H<sub>2</sub>.

4279. (currently amended): The mixture of claim 4260, wherein the non-condensable ~~hydrocarbons further comprise component comprises~~ H<sub>2</sub>, and wherein greater than about 15 % by weight of the non-condensable ~~component~~hydrocarbons comprises H<sub>2</sub>.

4280. (currently amended): The mixture of claim 4260, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane, to methane~~ is greater than about 0.3.

4281-5149. (cancelled)